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ABSTRACT

The use of cable television at Oregon State University is described in the sixth of a series of profiles that will document the experiences of 24 institutions. Implementation of the technology is reviewed, as well as methods by which the educational needs of the university were met by it. Inducements for the cable operator are cited. In the early years of the cable program, a number of courses were offered simultaneously in televised and conventional classroom form, which offered an opportunity to compare the achievement of students in the two settings. Benefits of the cablecasting program are described, such as: easy use of audiovisuals, increased innovation, small closed circuit users, and impact on university-community relations. Some disadvantages and problems are mentioned, but it is also noted that the cablecasting operation results in substantial savings for the university. Suggestions for implementing such a program are offered. (LBH)

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*Educational Technology Revisited*
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# Teaching by Cable: The Experience of One University

There are now two decades of experience with the use of instructional technology in colleges and universities. A look at what they have learned may benefit other considering new ways to teach. This profile describing the use of cable television at Oregon State University is the sixth in a series of profiles that will document the experiences of two dozen institutions. It was written by Ralph Lee Smith, author of *The Wired Nation*, and chairman, Public-Cable, Inc. Mr. Smith is also associate professor, School of Communications, Howard University. The reports in this series are supported by a special grant to EFL from The Ford Foundation.

Anyone who thinks that the use of technology in education tends to deaden individuality or foster conformity would be hard put to explain some of the things that are happening at Oregon State University. These and other notions have undergone some interesting tests during the university's nine-year-old program for using cable television to deliver course material. Originally launched to meet certain specific needs, the program has generated information and experience that bear on problems confronting educational planners and administrators today.

The OSU experience also bears on one of the biggest puzzles in the emerging world of American communications — the relationship between cable TV and education. Cable, with its many channels, its low transmission cost, and its exact system of local distribution, appears to offer major opportunities for wider dissemination and easier accessibility of learning. But, despite a number of exceptions, the gap between promise and performance has so far been wide. Many colleges and universities, although intrigued by cable, have been baffled about how to organize and implement its effective use.

The results of this failure are potentially serious. When the FCC promulgated its basic cable rules in 1972, it required that all cable systems built thereafter in the nation's top 100 markets must provide a free channel for educational use. This requirement, along with others relating directly or indirectly to education, is scheduled for review in 1977. Cable, hitherto largely confined to small- and medium-size communities, may well be entering many major metropolitan centers within the next several years. Without a stronger showing of the need, the viability, and the value of educational uses, the FCC requirement could be cancelled or abridged. Less favorable conditions could be conferred by cities too, which also control some degree of cable regulation through their local franchising power. As a result, education could receive low priority in policy making and system planning in urban centers. Access under favorable economic arrangements, and substantial channel capacity for educational delivery, could both be lost. At a time when educational planners are seeking the twin goals of outreach and reduced cost, this loss is one that higher education cannot afford. A note of urgency is added by the success and promise of several cable/college links that have already been established. One of the most extensive of these is at Oregon State.

Located in Corvallis, a city of 30,000, Oregon State University is a land grant institution whose enrollment has been limited by the legislature to 15,000 students. Since 1966 it has transmitted much of the content of many courses over the local cable system, Corvallis Cable Company. This system is linked by microwave to systems in two nearby towns; Albany and Lebanon. All three are now owned by Liberty TV, a multiple system operator. Their combined subscribership is about 9,000.

The videotaped programs are transmitted from the Classroom Television Center on the OSU campus, which has a direct cable link to the Corvallis Cable Company headend. From there, the programs go out over a channel on the cable system that is reserved for

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university use. They are simultaneously shown on the university's own closed-circuit system, which links 18 classroom and dormitory buildings, so that students can view them at convenient campus locations. Enrollment for the courses totals 8,600 per year — over half the total enrollment of the university. Seventy percent of the viewing by students is done off campus.

**From "Failure," the Seeds of Success**

Oregon State's experience with TV goes back to 1957, and originally did not involve cable. In that year The Ford Foundation funded an experiment for intercampus exchange of courses by TV among Oregon State, the University of Oregon, the Oregon College of Education, Portland State College, and Willamette College. The state's first public television station, KOAC, was built with Ford funding to transmit the programming to all the participants, when it was found that transmission by telephone company facilities would be prohibitively costly. Courses were created at each institution which could be taken by TV, for credit at the others.

The exchange program ran until 1963 when it was phased out. By the most generous estimates it was not an over-all success. Professors teaching a given subject at one institution were often less than enthusiastic about having students enroll for imported TV courses with similar content. Ironically, the higher the quality of the import the cooler its reception by some resident professors. By the end of the experiment there was little enrollment for any of the courses on campuses other than the one on which the program originated.

Nonetheless, the experiment played a seminal role in Oregon education and public service. KOAC remained on the air and became one of the principal public broadcasting outlets in the Northwest. Of more direct relevance to OSU's subsequent success with cable, faculty resistance to TV teaching, originally high, lessened. And certain professors developed a positive interest in TV's potential as a teaching tool.

A significant lesson was buried in the debris of the old program. One course did notably well. It was an unpretentious one-credit offering in General Hygiene, which maintained strong inter-university enrollment while more ambitious courses languished. The reasons were simple. Several of the participating institutions wanted to offer the course, but only one had a full-time faculty member with experience in teaching it. It filled a definite need, and filled it economically.

**Meeting Needs by Cable**

In the early and mid-1960s, OSU had an immense increase in student enrollment. Between 500 and 1,000 students were signing up each academic quarter for required basic courses. Such enrollments swamped the capacity of the departments for teaching in traditional classroom fashion. The problem was compounded by the fact that many of the heavy enrollment courses were sequenced, so that students could not take the second or third segments until they had taken and passed the first. Students' progress through the university was threatened by this blockage.

The university faced two alternatives: to conduct auditorium-sized classes, or to hire many new faculty members and embark on a building program to create more classrooms. The second alternative was never a practical one within the limits of the budget.

A third direction was suggested by the old Ford program, and in fact the university experimented with offering segments of certain courses in over-the-air broadcasts on KOAC. But the arrangement was not a comfortable one, since KOAC's developing mandate as a full-fledged public broadcasting facility brought into question its use by one university for credit course offerings.

Coincidentally, in 1964 the town of Corvallis granted a franchise for the building of a cable system. The university saw in this a possible solution to its problem and approached the cable company with a proposal of potential mutual benefit. The company was receptive and an agreement was reached which provided that one of the system's 12 channels, channel 5, would be assigned to the university. The cable company also agreed to donate the labor for the wiring of a closed-circuit system on campus, with the university providing $6,000 for the materials.

On September 1, 1966, Oregon State University went on the air, or, more accurately, on the cable, with a program of course offerings that has since become one of the most extensive, and probably one of the most successful, in the country.

**Inducements for the Cable Operator**

Private corporations, in business for profit, are not [illegible] for giveaways. What, then, was in it for the [illegible] company?

As it happens, its owners had a strong personal interest in communications technology for education. But more to the point, they had a practical incentive, too. Through the arrangement with OSU, the company receives a large amount of programming free of charge, which can and does increase the number of its subscribers.

In addition, all students wishing to receive the programming off-campus, must have access to a cable-connected receiver. It is now nearly impossible to rent

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a room or apartment to a student in Corvallis if it does not have cable TV.

The programming also interests a large number of townspeople, who follow it, sporadically or regularly, without being formally enrolled at the university. For these viewers, the programming is an added inducement to subscribe to cable service.

Apart from the formal course offerings, the cable company's link to the university's closed-circuit system gives it access to university functions and activities, some of which it cablecasts over Channel 11, its own local origination channel. These include speeches by prominent persons who visit the campus, and a wide range of sports events.

Cable subscribership, which stood at 1,600 when the university programming began in September, 1966, jumped to 2,200 by the end of that year, and stands at 9,000 today. The company attributes 30% of its subscribership to the programming that it receives from the university — which, at a monthly subscriber's fee of $5.50, amounts to almost $200,000 per year.

**The Classroom TV Center**

OSU's Classrom Television Center, set up in Kidder Hall, on the campus, makes and transmits the tapes for the programs that go out over the cable, and over the closed-circuit system to individual classrooms.

The center's investment in equipment is about $170,000. Its operating budget is about $82,000 per year, which includes the salaries of its seven staff members: the director (one fourth of whose salary is paid by the Department of Speech Communication, where he teaches), the production manager, research assistant, chief engineer, two broadcast technicians, and a clerk-typist.

The center's equipment includes two Ampex 1100 two-inch quad videotape recording machines (VTRs) of standard commercial broadcast quality, adapted to high band color; Ampex helical scan VTRs for two- and one-inch tapes; and SONY half-inch helical scan VTRs, as well as three-quarter-inch videocassette recorders. In addition to the studio facilities in the center itself, two classrooms have been wired for TV recording. One has remotely controlled equipment that operates without the presence of a technician. In the other, the equipment may be manned or remotely controlled, as needed.

One of the major facilities that the center has built up is its large, ever-growing library of tapes. The collection, valued at more than $200,000, provides a rich pool of visual material for televised lectures as well as for other campus programs and activities.

**Making and Using the Tapes**

In one pattern followed with variations by a number of departments, students enrolled in a three-credit cable course watch two videotaped lectures per week made by the professor giving the course, and then attend a one-hour recitation period conducted by a graduate assistant or full-time teaching assistant. Students may have individual contact with the professor during his office hours. Four-credit courses include three taped lectures per week plus the recitation; or, in the case of science courses, two taped lectures plus a recitation period and a lab.

A professor wishing to go on the cable with his course meets with the center's director and production manager for an orientation in the use of TV. He then outlines the series of lessons, bearing in mind the one ground rule established by the center — that, for each hour-long lecture, the professor cannot be on camera as a "talking head" for more than 15 minutes. The rest of the lecture must be composed of visuals for which the professor provides commentary, or visuals that have their own sound track.

Working with the teacher, the center develops the visuals. Some can be drawn from the center's tape library; others are created by the Instructional Resources and Media Center, located next to the TV Center, which provides audio-visual services to the university. Segments of material from outside sources are also used.

During this preparation stage the professor must work hard. As many as 200 hours of preparation may go into the making of some of the one-hour tapes.

Things are easier for the professor during the next several years while the tapes are being used, but he does not drop out of the picture. Each year he updates various portions of the tape series. After about three years, most professors undertake a revision of the entire series, sometimes making a full set of new tapes.

The professor has various incentives to participate in the program. One of them is quite direct. During each academic quarter when his tape is running, a teacher who would normally carry a 12-credit load has his load reduced to nine credits. This gives him more time for research, reading in the field, and/or more contact with individual students. Some departments also reduce the professor's load by three credits *while* he is making the tapes. Even if this is not done, however, professors appear to find the making of the tapes not overwhelmingly burdensome.

A second incentive is the conviction that many professors who participate in the program come to feel that it offers worthwhile solutions to the problem of teaching large class enrollments.

Some professors go further. After having some experience with TV, they prefer it for conveying certain portions of their courses, regardless of enrollment size. "I would never teach again without TV," says Dr. Robert Kiekel, associate professor of Modern Languages, whose use of cable in his courses will soon be described. Dr. Livingston, the center's director who by now has seen teaching in many fields, says, "Almost any course can be improved by careful planning of at

least one TV lecture per week, regardless of the course content."

**The Program in Action**

The cablecasting schedule for Channel 5 for the Spring Quarter 1975 is shown in the box.

**SCHEDULE FOR CHANNEL 5**
*Spring Quarter 1975*

| | |
|---|---|
| *Mon – Wed* | |
| 7:30 am | Psychology I |
| 8:30 am | General Science |
| 9:30 am | Mathematics |
| 10:30 am | Economics *(Also Fri)* |
| 11:30 am | Atmospheric Science |
| 12:30 pm | Psychology I |
| 2:30 pm | Economics *(also Fri)* |
| 3:30 pm | Spanish I |
| 4:30 pm | Mathematics |
| 6:30 pm | Atmospheric Science |
| 7.00 pm | General Science |
| 8:00 pm | Economics *(also Fri)* |
| 9:00 pm | Mathematics |
| *Tues – Thurs* | |
| 7:30 am | Sign Language for the Deaf |
| 8:30 am | Spanish I |
| 9:30 am | General Science |
| 10:30 am | Spanish II |
| 1:30 pm | General Science |
| 2:30 pm | Atmospheric Science |
| 3:30 pm | Spanish II |
| 7:00 pm | Psychology |
| 8:00 pm | Spanish I Review |
| 9:00 pm | General Science |

A glance at this schedule shows that two lectures a week were scheduled for most courses. Each lecture was repeated several times during the day and evening so that students could watch it at times convenient to their personal schedules.

Courses that show two tapes per week avoid Fridays as a transmission day because recitation sections meet then, and because few students watch on Friday evenings.

As the schedule reveals, Channel 5 has little or no space left for more courses, a problem to which we shall return. In the spring quarter, one course, a Computer Short Course teaching Fortran, spilled over onto the company's local origination channel, Channel 11, where it was shown four times a week by courtesy of the cable company. The local origination channel's own broadcasting schedule does not permit repeated transmission of courses during the day, and its use does not offer a practical solution to relieving the pressure on Channel 5.

**TV, the Teacher, and the Student**

Different departments and professors have evolved diverse techniques for incorporating the cablecasts into their teaching. These arise from differences in subject matter, in objectives, and in educational philosophy. Here are four instances which show that those using the medium have molded it to their purposes rather than being molded by it.

● In the General Science Department the course tapes are made by all the professors, working as a team. Two or three tapes are made by one teacher who covers a given area; the next area is covered by another teacher in the next several tapes, and so on through the course.

As part of this team teaching method, each 30-student recitation section meets in groups of six, sitting around tables for informal discussion. The professor himself handles as many sections as possible (assistants handle the rest), and moves among the tables, participating in the discussions.

● In economics, Professor Lafayette Harter gives a 4-credit basic economics course for nonmajors that includes three tapes a week plus a recitation. He handles the recitation section himself. "We have to introduce concepts that take time to lay out, that won't be brilliant or fascinating," he says. For this, he believes that continuity of contact with the person setting forth the ideas is important.

● Dr. Fred Decker, professor of Atmospheric Science, took some correspondence courses himself a number of years ago. He is particularly interested in independent learning, and in the contribution to it that can be made by communications technology.

Dr. Decker uses the contract grading system, with students receiving grades for specified levels of accomplishment as shown in quizzes and completed projects. The full course is given on tapes. There is a regular, voluntary consultation session, to which a third or two thirds of the students come, but there is no penalty for nonattendance. "Last semester," he said, "my top student never showed up at the consultations. He got it all from the tapes."

● A contrasting approach is that of Dr. Robert Kiekel, associate professor of Modern Languages, who teaches the cable Spanish courses. Every taped lecture in his series is watched by his students *in the classroom,* though they may also see them on the cable if they wish. The first 30 minutes are spent watching the tape. In the last 20 minutes which are spent in "reinforcement," Dr. Kiekel spends a bit of time working with each student. The net effect is more, rather than less, attention to the specific problems of each student.

The portions of the course that are taped relate to basic conceptual and grammatical elements of Spanish that differ from English. Developed with Dr. Walter Lusetti, chairman of the department, the series is titled "The Major Linguistic Features of Spanish and English."

"My idea of language learning," Dr. Kiekel says, "is first to build a 'linguistic awareness,' which we do through the TV program. Competence comes faster that way. The TV segment is a mind opener, and gives

students the orientation they need. They seem to grasp it all more easily when they see it first on TV."

● A number of teachers using cable have evolved "TV Guides," specially designed to supplement their TV lectures. These guides, available in the college bookstores, tie the written portions of the study material to the TV presentation, thus strengthening the quality of the course.

**Evaluation**

In the early years of the cable program, a number of courses were offered simultaneously in televised and conventional classroom form. This offered an opportunity to compare the achievement of students in the two settings.

The biology department conducted a study in which the exam scores and grades of students in the TV section were compared to those of students in five conventional sections. At this time the TV course had no recitation section; it consisted simply of three TV lectures per week, plus a lab. The TV class outdistanced all the conventional classes in exam scores and grades.

When the economics department began cable teaching, it ran a cable course for one quarter, then ran the course in traditional classroom format for the next two quarters. Students in both the TV class and the regular classes were administered the Test for Understanding College Economics (TUCE), a standard achievement test in the field. There was no difference in scores between the TV and the conventional classes.

A study of an English composition course offered by TV, produced similar results. The study, which became a Ph.D. thesis, focused on both academic achievement and student attitudes toward the television instruction. The course received excellent ratings in both areas. Ironically, the department chairman retired the following year and the new chairman opposed to the use of technology to teach English, dropped the course.

Meanwhile, students did their own kind of evaluating; they voted with their feet. Where courses were simultaneously offered by TV or in conventional format, they tended to choose the TV course. The pattern was soon changed so that conventional classes are not offered for courses that are given by cable.

The effectiveness of well-conceived courses taught totally or in part over TV is now widely accepted at Oregon State, and evaluations to test this point are not currently being made. The TV courses themselves, however, receive continuing and searching overview.

Evaluation of courses basically rests with each department, which shares the task with the professors who do the teaching. Each department sets its own criteria for the quality and objectives of its instruction.

The Faculty Senate has also created a Classroom TV Committee consisting of six faculty members from different schools, Dr. Livingston ex officio, and two undergraduate students. This committee has helped to set up guidelines for selection of the courses to be televised and has recently prepared a suggested form for use by departments in evaluating TV instruction. On three occasions the committee has recommended changing or dropping a course, and in each case its recommendations were concurred in by the department and professor involved.

**The Benefits**

Most observers at Oregon State agree that the cablecasting program has helped to solve the problem of effective teaching of high-enrollment classes — the problem that originally brought the program into being. That opinion is shared both by enthusiasts of the technology and by those teachers who prefer traditional teaching methods. "If I had my druthers," says economics professor Harter, "I'd teach no more than 25 students, using more conventional means, and would home in more on current events. But this is undoubtedly superior to teaching a class containing 150 to 200 kids."

In addition, professors and department heads report benefits from taped lectures that do not relate to class size.

The taped lectures, well prepared and delivered, are superior to lectures on the same subject delivered in class. "All the professors agree," says Dr. Livingston, "that their taped lectures are the best they have ever done."

● **Easy Use of Audio-Visuals.** Another advantage is far greater ease in the use of audio-visuals. The question of which graphic materials will increase the learning experience can be fully considered, and they can be smoothly incorporated into the narrative. Still photographs and small segments of films and tapes can all be used in a single lecture. Funny drawings and animated sequences, provided by the Instructional Resources and Media Center, can liven up the discussion of difficult or abstract problems. And materials which would be impractical to bring into the classroom in any other way can be introduced.

"For linguistic awareness in my language class, I use visual elements that would be impossible to employ in direct classroom lecture," says Dr. Kiekel. "For example, verb forms come marching out and marching in, in animation. Pictures, posters, sarcasm, views of romantic far-off places — all of these are in my tapes. Teaching is enhanced by appeal to humor, to emotion, and to people's sense of adventure. You simply can't do all this in a classroom lecture."

In his economics course Dr. Harter has a brief sequence of a stripteaser at work, followed by a brief sequence of a teacher teaching in a classroom. Why, he asks, does one earn more than the other? — from there

he launches into a discussion of distribution of income.

As administrators and professors have become increasingly aware of the value of building up the Classroom Center's tape library, it has become the custom to include a tape interview at the Center among the round of activities of important visitors. In this way, additional instructional value is gained from such visits. When Walter Heller, former chairman of the President's Council of Economic Advisors, visited the campus, Dr. Harter interviewed him on tape and included segments in his lecture series. When Lincoln Rockwell, late chairman of the American Nazi Party, visited Oregon State, a member of the political science department taped an interview with him which the department regards as a vivid illustration of the propaganda techniques used by the group.

Also, material that appears on broadcast television can be taken off on tape at professors' requests. The material can then be retransmitted to classrooms, in whole or in part, and segments can be used in taped lectures.

● **Innovation Spurred.** Increasing familiarity with the uses of the medium has stimulated experimentation. In some cases, additional funds have been found to try new ideas. The taped series on the major linguistic features of Spanish and English, made by Professors Lusetti and Kiekel, was financed by a grant for which they had written a proposal.

Other experiments stimulated by the TV courses go beyond the content of the videotapes, and involve the creation of study options.

Dr. Harter is planning a series of brief audiotapes that students can use for drill in difficult areas. The tape will pose a problem; the student turns it off, tries to solve it, then turns the tape back on and listens to the professor's explanation and solution. Students will be able to use a variety of such tapes at times and places convenient to their own schedule. In turn, the professor's time will be freed for other student problems.

Dr. Decker, pursuing his interest in independent study, wants to learn whether some students can be freed from even the time constraints of the cable schedule. Several nearby community colleges have audio-visual centers equipped for individual viewing, to which students can bring videotapes for use any time during the day or evening. Dr. Decker is planning an experiment in which selected students will be provided with the full series of tapes for his cable course, and learn the material at their own pace with no written or telephone contact with him.

Still other kinds of innovation have resulted from the use of the medium. The setting up of TV rooms in the residence halls, for example, focused administrative attention for the first time on the concept of dormitories serving as "living-learning" centers. This led, in turn, to branch libraries and study centers in each hall.

● **Small-Enrollment Courses Feasible.** Still a further advantage of cablecasting is suggested by the success of the General Hygiene course in the Ford program. Courses with small, rather than large enrollments, can be prepared, using the specially commissioned services of an expert whom the university cannot afford to retain full time. An example is the course in sign language for the deaf, listed in the Spring 1975 schedule. The tapes for this course were prepared by a nationally recognized expert, and the recitation sections were handled by graduate assistants in the speech department who are specializing in services to the deaf.

● **Student Reactions Positive.** The attitude of students to the TV courses is, on the whole, favorable. Some students, like some teachers, would prefer to have all their education conducted in a traditional classroom setting. Nearly all students, however, seem to share the view of the teachers that the TV arrangements are preferable to mass lectures.

Many students actively prefer the TV course arrangement. The flexibility achieved by showing the same lecture several times daily appears to be particularly appreciated. The arrangement eliminates most of the schedule conflicts that plague the conventional curriculum and prevent students from getting the course they want, when they want it.

"I'm very satisfied with taking TV courses," says Ms. Marlene Morgan, a senior in Home Economics. "First, there is the convenience. I don't have to make special trips to campus. Second, I can pace myself, and can watch lectures more than once when I need to. I'm a slow learner in the sciences, and this way I can learn without inconveniencing the teacher or other students. We've been asked if we think it's impersonal, but my answer is no. We're exposed to the staff during recitations and labs, and the teacher is available during office hours." (A true child of the communications revolution, Ms. Morgan, when asked by Dr. Livingston for her opinions for this article, took an audiotape recorder, recorded her views at a time convenient to her, and returned the recorder to the TV Classroom Center. When I called from Washington, D.C. for the information, the tape was played to me on the phone. Neither of us had to coordinate with the other's schedule.)

● **Closed-Circuit Users Benefit, Too.** A spin-off effect of the cable courses is that they have greatly stimulated the transmission of materials to conventional classes over the closed-circuit system.

Usually, a professor will not go to the trouble of getting a projector and operator into the classroom to show a film. But if a film, a tape, a retransmission of an over-the-air TV broadcast, or segments of any of these can be transmitted to the classroom via closed circuit simply by calling the Classroom TV Center, such a request is more likely to be made. And once done, there is a likelihood of doing it regularly. "All of the

center's services are available right away, without formalities," says Dr. Livingston. "There are no forms to fill out, and no up-the-ladder request procedures. The professor calls or drops by, tells us what he wants and when, and we do all the rest."

Increasing use is also being made of the two classrooms set up for videotaping. Practice-teaching, speech making, and the like, are recorded and played back for self review and class assessment. Any teacher may schedule his or her class in these rooms and be recorded for later playback and self-evaluation. This is required, in fact, of all teaching assistants handling chemistry recitation sections. The remote cameras are used; no technician or outsider is present. After use, the tapes are erased.

Another developing use of the closed-circuit system is the taping of single lectures by professors of conventional classes who must be absent from the campus, and would otherwise have to call off their classes. The taped lectures are transmitted to the appropriate classroom at the designated hour.

● **The Community Weal.** Yet another benefit of the cable program is its service to the community and its wholesome effect on OSU-community relations. Many townspeople watch the cable courses; some, for professional reasons. A number of business firms in Corvallis ask their executives to watch the Computer Science course, for example. And many persons, including those seeking a pilot's license, watch the Atmospheric Science course. That course, in fact, has proven so popular that a shortened version, in color, ran on Station KOAC during daytime hours, and will be transmitted during evening hours in the fall.

Among those who use the cablecasts are Corvallis high school students. In particular, they watch a library orientation course given during the first two weeks of each quarter, and the language courses. The latter seem to be a particular favorite among adults in the community.

### Disadvantages and Problems

There are, of course, difficulties and drawbacks associated with taping of lectures. One is that, for the professor it is a very different kind of experience from classroom lecturing. All professors require some time to adjust to it, and some are never able to adjust to it fully. "I have one man who will never make it," the head of one department told me.

"You can be more relaxed and ham it up a little in the classroom," says Dr. Harter. "That's harder to do on tape, when there's no interaction with a live audience. You just don't feel like it, and it doesn't look the same."

"I'm not a polished actor," another professor said wistfully. "I wish I could give my script to a professional actor!"

(Note: this is a matter having an impact on the hiring process. In departments that make substantial use of TV, the ability to communicate well is increasingly a factor considered in the hiring of new personnel.)

Another concern is the amount of material covered in a tape lecture. Well-organized tape lectures usually contain a good deal more content than a conventional classroom lecture, and there is a danger of overloading. This can be especially difficult in courses intended for persons not majoring in that subject. A taped math course for nonmajors was one of the less successful courses, because the viewers did not have a strong enough math background to handle so much material without the presence of a live teacher to provide substantial on-the-spot help.

Still another problem is the incorporation of up-to-the minute content into courses that deal heavily with current affairs, like political science and economics. If the professor likes to use daily newspapers and weekly newsmagazines as texts, the difficulty is heightened. Use of the recitation period can provide a partial solution, but not a complete one.

Finally, an issue in the public televising of classroom lectures about which some professors have expressed concern, is that it provides an invitation to bring public pressure to bear on the content of courses, and on what professors say. There have been no instances of this as yet at Oregon State, but professors are aware when making their tapes that the community as well as the students will be watching. In controversial areas this can, and in some instances may already have, affected content.

### Economics of Cablecasting

The cablecasting operation results in substantial savings for Oregon State, although its cost-effectiveness is easier to assess in some areas than others.

In 1971 RAND Corporation issued a study of the economics of the OSU cable operation.[1] Basing its estimates on the value of teacher time saved by the program, and using figures then current for all costs, RAND estimated savings of $128,000 per year on the assumption that an acceptable alternative would be to place students in conventional classrooms with 25 in each section. Dr. Livingston regards the estimates as basically sound, with a moderate increase in all figures for inflation.

This estimate, however, does not take several important factors into account. Oregon State does not have the classroom space to accommodate the present enrollees, in sections of acceptable size, in conventional teaching arrangements. New classrooms would have to be built. On the assumption that the capital cost of such construction would be written off over a 20-year period, the university estimates that it is saving $40,000 per year by not having to build.

A subsidiary savings attributable to the cable experience lies in increased utilization of the existing plant. When the cable courses were started, they were virtually the only night offerings of the university. Their example led to a major shift in policy and now, the evening is regarded as just as appropriate as daytime for the scheduling of *all* classes.

Though the added quality of instruction that is made possible by the Classroom TV Center is intangible, there are direct savings that are achieved by its possession of certain materials and tapes.

Some tapes, such as one showing the birth of twin lambs, are of high instructional value and increase the educational capacity of the university. Others, such as a tape of certain complex uses of oscilloscopes, save faculty time that need not be devoted to setting up the same experiments repeatedly. Also, experiments shown on tape instead of performed live for each class, reduce the need for multiple pieces of equipment and materials.

**A Few Pointers and Suggestions**

Asked for his suggestions to others, Dr. Livingston offered these:

- A receptive, experimental top administration is essential, as are receptive department heads.
- The program should address itself to real needs. Subsidiary benefits will flow from these.
- The key to the use of technology is easy accessibility. An equivalent to OSU's Classroom TV Center should be set up by any campus considering a major cable program, and its mission of serving professors making the tapes as well as professors wishing delivery of closed-circuit material, should be assiduously fulfilled.
- In making tapes, consideration should be given to how much they are likely to be used, and to how long they may be of value. All tapes, when stored for long periods of time, suffer electronic loss that shows up as defects in the picture. Two-inch tapes suffer the least loss, but cost three times as much to make. The equation involved is an obvious one, and must be carefully considered whenever a tape is made that will be placed in the tape library.
- A high degree of reliability in transmission is essential, and appropriate equipment must be purchased to make this possible. OSU's purchase of a second Ampex two-inch quad machine, a costly piece of equipment, was principally for backup purposes.
- .With regard to the acquisition of taped material from standard sources such as the Great Plains Instructional Video Library, Dr. Livingston and his colleagues find that a vacuum exists. OSU's major need is for small bits and pieces illustrating specific ideas and issues rather than for full programs and courses. But neither Great Plains nor any other major source provides such material.
- OSU and many other universities now possess large libraries of tapes, but there is no way other than by word of mouth and accidental contact to discover what these holdings are. "What we've got to do," Dr. Livingston says, "is create a means for informing each other about what we have, and provide a system for exchange."

**Looking to the Future**

The university has begun to use one of three FM bands available on the cable, to broadcast some course material by audio. It is also studying possible uses of dial access, which would enable students to listen to audio cassettes of course material by dialing a telephone number.

Neither of these, however, will solve the problem the university faces — shortage of channel space on the cable system. For all practical purposes, Channel 5 is booked up solid, and the university's needs for cable far exceed the capacity of this one channel. In the early years of the program, Dr. Livingston encouraged professors to step forward and try the cable; now, a professor who wishes to create a cable course must wait in line. "During the next two years," says Dr. Livingston, "I could use three channels from 7 to 10 at night, and could use two channels during the day, turning out 80 hours per week of programming."

There is no solution in sight for this problem. Corvallis Cable Company's system was built with a 12-channel capacity, and all channels are in use. A complete rebuilding of the system to provide greater educational capacity is almost certainly not in the cards from an economic point of view.

The problem bears with it a warning and a foretaste of what can happen in metropolitan centers if cable systems are built without adequate capacity for educational needs. This, in turn, will depend on whether colleges and universities take enough creative steps, in time to convince municipal franchising authorities, state regulators, and the FCC, through actual performance, that higher education needs cable, and can make effective use of it. As this issue is addressed in urban centers during the immediate years to come, Oregon State's success can serve as a valuable example.

*–Ralph Lee Smith*

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Note: Other colleges and universities that transmit courses over cable systems include the University of Oregon, Eugene; Lincoln University, San Francisco; Flathead Valley Community College, Kalispell, Montana; Central Missouri State University, Warrensburgh; the City College of New York; and the University of Amarillo, Texas. None of these, however, as yet makes as extensive use of cable as does Oregon State.

1. Leland L. Johnson, *Cable Television and Higher Education: Two Contrasting Experiences.* R-828-MF, September 1971. Now out of print but available in the library of the Cable Television Information Center, Washington, D.C., the library of the RAND Corporation in Santa Monica, California, and other libraries.